The next-generation model that surpasses the CA-210
For high-speed, high-accuracy measurements of LED-backlit LCD TVs

LED television

Smartphone

Uniformity

Display Color Analyzer
CA-310
Support for LED backlights
Our previous Display Color Analyzer CA-210 could adjust the white balance of LED-backlit LCD TVs to $\Delta xy=0.010$, but the new Display Color Analyzer CA-310 enables adjustment to $\Delta xy=0.003$ so colors are even more true, as can be seen below.

### White balance adjustment of LED-backlit LCD TVs

<table>
<thead>
<tr>
<th>CA-310 adjustment results</th>
<th>CA-210 adjustment results</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta xy=0.010$</td>
<td></td>
</tr>
<tr>
<td>$\Delta xy=0.003$</td>
<td>Target color $\Delta xy=0.000$</td>
</tr>
<tr>
<td>$\Delta xy=0.003$</td>
<td></td>
</tr>
<tr>
<td>$\Delta xy=0.010$</td>
<td></td>
</tr>
</tbody>
</table>

White balance adjustment has advanced even further!

Enables high-speed measurement of even extremely low luminances down to 0.005 cd/m$^2$

Sensor noise reduction technology has been used to enable measurements even in the extremely low luminance region around 0.005 cd/m$^2$ at speeds as fast as 4 times per second. This allows the high-speed high-accuracy measurement essential for manufacturing high-grade displays. In addition, at luminances higher than 2.0 cd/m$^2$, 20 measurements per second are possible.

Reduces errors due to LED emission distribution variations to less than 1/3.

Variations in the emission distribution of LED backlights result in individual differences of about 10nm in peak intensity wavelength. If LED-backlit LCD TVs with such individual differences are adjusted using conventional color analyzers, color differences of close to 0.010 on the xy chromaticity diagram may occur. But the CA-310 has sensor sensitivities that more closely match the CIE 1931 color-matching functions, enabling the color difference in the same case to be reduced to around 0.003, suppressing errors to less than 1/3.

**Errors (differences from true values) for white LEDs with different peak wavelengths when measured using CA-310. User calibration to standard LED performed.**
**PC Software for Color Analyzer CA-SDK (Standard accessory)**

Standard accessory SDK helps create software easily according to needs. Sample software is bundled; you can start data collection easily.

### Required system
- **OS**: Windows® XP, Vista, 7

Windows® and Excel® are a trademark of Microsoft Corporation in the USA and other countries.

### System Diagram

- **Multi Probe (Optional)**
- **Standard Hood for CA-210/310 CA-H10 (Standard)**
- **Small Hood for CA-210/310 CA-HS10 (Standard)**
- **Standard Lens Cap for CA-210/310 CA-H11 (Standard)**
- **Small Lens Cap for CA-210/310 CA-HS11 (Standard)**
- **CA-310**
- **4-Probe Expansion Board CA-B15 (Optional)**
- **USB Cable IF-A18 (Optional)**
- **PC Software for Color Analyzer CA-SDK (Standard)**
- **AC Power Cord (Optional)**
- **PC (Commercially available)**
- **PC-AT compatible**

### Probe variations

This table is based on the most popular method for controlling emission intensity for each display type.

* Measurements of displays using certain control methods are not possible. For details of measurement compatibility, contact your nearest Konica Minolta representative.

Examples for which measurement is not possible:
- Displays which use PWM, etc. for control of emission intensity.
- Displays with backlights which emit intermittently.
- Displays which write black for each frame, etc.

### Applicability for different display types

<table>
<thead>
<tr>
<th>Display Type</th>
<th>Active Matrix Driven</th>
<th>Passive Matrix Driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmissive / semi-transmissive LCD</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>OLED</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>PDP</td>
<td>○</td>
<td>○</td>
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<tr>
<td>FED</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Rear Screen Projector</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>LCD</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>DLP</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>CRT</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

○ Recommended
△ Measurement possible with restrictions, but probes marked with ○ are recommended
× Measurement not possible

(LEd Flicker Measuring Probes are unsuitable for measurements of CRTs.)
**Specifications**

**Model**
- CA-310 (LED Universal Measuring 07/Probe)
- CA-310 (LED Universal Measuring 10/Probe)

**Detector**
- Silicon photo cell

**Measurement area**
- 810 mm

**Acceptance angle**
- ±2.5°

**Measurement distance**
- 30±5 mm

**Display range**
- 0.000 to 1000 cd/m²

**Chromatcity**
- Displayed in 4 or 3-digit value (Can be chosen)

**Measurement range**
- 0.0500 to 1000 cd/m²

**Accuracy**
- ±0.5 dB (Flicker frequency: 30 Hz AC/DC 4% (-40 dB) sine wave)

**Repeatability(2σ)**
- ±0.0030 cd/m²

**Detector**
- Silicon photo cell

**Probe Ø49×208 mm / 530 g
- Ø49×236 mm / 550 g
- Ø49×208 mm / 530 g
- Ø49×236 mm / 550 g

**Accuracy**
- ±1% ±0.0030 cd/m²

**Flicker**
- JEITA

**Input voltage range**
- 100-240V

**Operation temperature/humidity range**
- Temperature: 10 to 28°C ; relative humidity 70% or less with no condensation

**Luminance change**
- ±2% of reading for white

**Measurement distance**
- 30±5 mm 30±10 mm 30±5 mm 30±10 mm

**Temperature/humidity range**
- 0 to 28°C : relative humidity 70% or less with no condensation

**Storage temperature/humidity range**
- 28 to 40°C : relative humidity 40% or less with no condensation

**Flicker (Contrast method)**
- 4(3.5) times/sec.

**Accuracy**
- ±0.5 dB (Flicker frequency: 30 Hz AC/DC 1.2% (-50 dB) sine wave)

**Repeatability**
- ±0.0040 cd/m²

**Display**
- Digital xyLV, RGB analyze, XYZ, u’v’L V

**LED**
- 16 characters by 2 lines (with backlight)

**SYNC mode**
- NTSC, PAL, EXT, UNIV, INT

**Screen visibility**
- Vertical synchronization frequency: 40 to 200 Hz

**Chemical management, calibration, and service**
- Subject to change without notice.

**LED Universal Measuring ≤27 Probe**

**Flicker Measuring ≤10 Probe**

**SAFETY PRECAUTIONS**

For correct use and your safety, be sure to read the Instruction Manual before using the instrument.

- Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.

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Name, Address, Telephone number are subject to change without notice. For the latest contact information, please refer to the KONICA MINOLTA Worldwide Web site.

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